

# PROGRAM

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## Sunday, 18 July 2021

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13:00 – 18:00 **Session for testing zoom connections (Wednesday, July 14 - Friday, July 16)**

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13:00 – 16:00 **Final testing (Sunday, July 18)**

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# Monday, 19 July 2021

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08:00 – 08:30

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## Opening addresses

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*Location: Virtual Zoom Session*

08:30 – 10:20

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## 1 session: Quantum optics

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*Location: Virtual Zoom Session*

08:30 – 09:00

Franco Nori:

*Quantum Nonlinear Optics without Photons, how to excite two or more atoms simultaneously with a single photon, and other unusual properties of ultra-strongly-coupled QED systems*

09:00 – 09:30

Howard M. Wiseman:

*The Heisenberg Limit to Laser Coherence*

09:30 – 10:00

Warwick P Bowen:

*Absolute quantum advantage in light microscopy*

10:00 – 10:20

Denis V. Vasilyev:

*Quantum Variational Optimization of Ramsey Interferometry and Atomic Clocks*

10:20 – 10:40

Coffee break

10:40 – 13:00

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## 2 session: Many body physics

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*Location: Virtual Zoom Session*

10:40 – 11:00

Wolfgang Belzig:

*Higher-dimensional topology in multi-terminal superconducting structures*

11:00 – 11:20

Folkert Kornelis de Vries:

*Superconducting devices in magic-angle twisted bilayer graphene*

11:20 – 11:40

David Sanchez:

*Andreev drag effect in Coulomb coupled quantum dots*

11:40 – 12:00

Moshe Schechter:

*On the nature of tunneling two-level systems in amorphous solids, and the mitigation of their deleterious effects in superconducting circuits*

12:00 – 12:20

Efrat Shimshoni:

*Superconducting Dirac point in proximitized graphene*

12:20 – 12:40

Llorenç Serra:

*Scattering of topological kink-antikink states in bilayer graphene*

12:40	–	13:00	A. De Martino:	<i>Volkov-Pankratov states in topological graphene nanoribbons</i>
13:00	–	14:00	Lunch	
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14:00	–	15:20	<b>3 session: Quantum thermodynamics</b>	
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<i>Location: Virtual Zoom Session</i>				
14:00	–	14:30	Jianshu Cao:	<i>Thermodynamics and Symmetry of Driven Open Quantum Systems</i>
14:30	–	15:00	Yoram Alhassid:	<i>The thermodynamics of the strongly interacting cold atomic Fermi gas in the crossover from BEC to BCS</i>
15:00	–	15:20	Peter D. Keefe:	<i>Thermodynamics of Mesoscopic Superconductors</i>
15:20	–	15:40	Coffee break	
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15:40	–	17:10	<b>4 session: Foundations of quantum physics</b>	
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<i>Location: Virtual Zoom Session</i>				
15:40	–	16:10	Yuval Gefen:	<i>Measurement-Induced Quantum Steering</i>
16:10	–	16:30	Andrei Khrennikov:	<i>Getting rid of nonlocality from quantum physics through Bohr's complementarity</i>
16:30	–	16:50	Ana María Cetto:	<i>The physics behind quantum operators</i>
16:50	–	17:10	Luis de la Peña:	<i>How fast is a quantum jump?</i>
17:10	–	17:30	Coffee break	
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17:30	–	19:30	<b>5 session: Foundations of quantum physics</b>	
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<i>Location: Virtual Zoom Session</i>				
17:30	–	18:00	Gerard 't Hooft:	<i>Specific Models for Fast Hidden Variables, FreeWill, and all that</i>
18:00	–	18:30	Gregor Weihs:	<i>Multipath Interference Tests of Quantum Mechanics</i>
18:30	–	18:50	Denys I. Bondar:	<i>Decoherence-Free Entropic Gravity: Model and Experimental Tests</i>
18:50	–	19:10	Arkady Plotnitsky:	<i>"The Observations Obtained under the Specified Circumstances:" What quantum measurement is, and what it is not.</i>
19:10	–	19:30	Ehtibar Dzhafarov:	<i>Quantum contextuality: the most general definition?</i>



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## Tuesday, 20 July 2021

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08:30	–	10:20	<b>1 session: Biophysics</b>
<i>Location: Virtual Zoom Session</i>			
08:30	–	09:00	Peter V. E. McClintock: <i>Ionic Coulomb blockade and selectivity in biological ion channels</i>
09:00	–	09:30	Stefan Klumpp: <i>Coarse-graining discrete stochastic models of biochemical systems</i>
09:30	–	10:00	Michael Thorwart: <i>Vibronic quantum coherence at ultralow temperatures in photosynthetic protein complexes</i>
10:00	–	10:20	Yutaka Shikano: <i>Quantum Nanodiamond Thermometry for Biological System</i>
10:20	–	10:40	Coffee break
10:40	–	13:00	<b>2 session: Hall effect, Thermodynamics</b>
<i>Location: Virtual Zoom Session</i>			
10:40	–	11:00	Jiří J. Mareš: <i>Hall Effect and the problem of "hidden momentum"</i>
11:00	–	11:20	Takafumi Kita: <i>Charging and Thermal Hall Effect in Superconductors</i>
11:20	–	11:40	Konrad Viebahn: <i>Thouless pumping in a Floquet-driven lattice</i>
11:40	–	12:00	Thibaut Jonckheere: <i>Andreev reflection of fractional quantum Hall quasiparticles</i>
12:00	–	12:20	Jerome Rech: <i>Negative Delta-T Noise in the Fractional Quantum Hall Effect</i>
12:20	–	12:40	Jakub Spiechowicz: <i>Quantum analogue of energy equipartition theorem</i>
12:40	–	13:00	Gershon Kurizki: <i>Unitary and Non-Unitary Few-Mode Heat Machines</i>
13:00	–	14:00	Lunch
14:00	–	15:20	<b>3 session: Physics of quantum information</b>
<i>Location: Virtual Zoom Session</i>			

14:00	–	14:30	Steven Mark Girvin:	<i>Using Boson Sampling for Efficient Simulation of Molecular Spectra on a Small Quantum Processor</i>
14:30	–	15:00	James Freericks:	<i>Strategies for quantum chemistry on a quantum computer using a factorized form of the unitary coupled cluster method</i>
15:00	–	15:20	Sebastian Deffner:	<i>Energetic cost of Hamiltonian quantum gates</i>
15:20	–	15:40	Coffee break	
15:40	–	17:20	<b>4 session: Nonequilibrium statistical physics</b>	
<i>Location: Virtual Zoom Session</i>				
15:40	–	16:10	Michael Bonitz:	<i>Towards many-body quantum dynamics based on fluctuations</i>
16:10	–	16:40	Pawel Danielewicz:	<i>Dynamics of Correlated Systems with Nonequilibrium Green's Functions</i>
16:40	–	17:00	Michael Galperin:	<i>A Green's function perspective on the nonequilibrium thermodynamics of open quantum systems strongly coupled to baths</i>
17:00	–	17:20	Michael Ridley:	<i>Time-dependent electromagnetics of molecular junctions</i>
17:20	–	17:40	Coffee break	
17:40	–	19:20	<b>5 session: Many body physics</b>	
<i>Location: Virtual Zoom Session</i>				
17:40	–	18:10	Harold U Baranger:	<i>Driven-Dissipative Phase Transition in a Kerr Oscillator</i>
18:10	–	18:40	Dietrich Belitz:	<i>Soft modes in Fermi liquids</i>
18:40	–	19:00	Thomas Vojta:	<i>Collective modes at the superfluid - Mott glass transition</i>
19:00	–	19:20	Lorenza Viola:	<i>Manifestation of topology in metastable driven-dissipative bosonic systems</i>

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## Wednesday, 21 July 2021

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08:30	–	10:20	<b>1 session: Quantum Thermodynamics</b>
<i>Location: Virtual Zoom Session</i>			
08:30	–	09:00	Stephen M. Barnett: <i>Thermofields for Quantum Thermodynamics</i>
09:00	–	09:30	Maciej Andrzej Lewenstein: <i>From Generalized Resource Theories of Quantum Thermodynamics to Novel Quantum Thermometry</i>
09:30	–	10:00	Jens Eisert: <i>Quantum field thermal machines</i>
10:00	–	10:20	Konstantin Dorfman: <i>Incoherent control of optical signals: Quantum-heat-engine approach</i>
10:20	–	10:40	Coffee break
10:40	–	13:00	<b>2 session: Simulations</b>
<i>Location: Virtual Zoom Session</i>			
10:40	–	11:00	Jürgen T. Stockburger: <i>A novel quantum simulation method for complex system-reservoir dynamics</i>
11:00	–	11:20	Peter Schmitteckert: <i>Cluster Embedding Schemes</i>
11:20	–	11:40	Christian Kokail: <i>Characterizing Quantum Many-Body States via Entanglement Hamiltonian Learning</i>
11:40	–	12:00	Kareljan Schoutens: <i>Kink dynamics and quantum simulation of supersymmetric lattice Hamiltonians</i>
12:00	–	12:20	Ilya Sinayskiy: <i>Simulation of open quantum systems on NISQ Computers</i>
12:20	–	12:40	Andreas Wacker: <i>PERLind, a versatile approach to model bath coupling in quantum kinetics</i>
12:40	–	13:00	Doron Cohen: <i>Breakdown of quantum-to-classical correspondence for diffusion in high temperature thermal environment</i>
13:00	–	14:00	Lunch
14:00	–	16:00	<b>3 session: Poster Session</b>
<i>Location: Virtual Zoom Session</i>			
16:00	–	17:00	<b>4 Session: Physics of superfluids</b>

16:00	–	16:30	Fernando Sols:	<i>Superfluidity from correlations.</i>
16:30	–	17:00	Stephanie M Reimann:	<i>Effects beyond mean-field in bosonic quantum systems</i>
17:00	–	17:20	Coffee break	
17:20	–	18:50	<b>5 session: Physics of superfluids</b>	
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<i>Location: Virtual Zoom Session</i>				
17:20	–	17:50	Aneta Stefanovska:	<i>Non-Equilibrium Oscillatory Dynamics of Electrons on the Surface of Liquid Helium</i>
17:50	–	18:20	Vanderlei Salvador Bagnato:	<i>Quantum Turbulence in atomic superfluid: characteristics and presence of universality</i>
18:20	–	18:50	Ernst M. Rasel:	<i>Quantum gases in free-fall</i>



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## Thursday, 22 July 2021

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08:30	–	10:20	<b>1 Session: Nonequilibrium statistical physics</b>
<i>Location: Virtual Zoom Session</i>			
08:30	–	09:00	Thomas Gasenzer: <i>Universal dynamics far from equilibrium</i>
09:00	–	09:30	Francesco Petruccione: <i>Open quantum systems on quantum computers</i>
09:30	–	10:00	Mikko Möttönen: <i>Experiments on open quantum systems made of superconducting qubits with tunable coupling to their environment</i>
10:00	–	10:20	Carles Altimiras: <i>Experimental test of Kubo relation in a non-linear quantum conductor driven out of equilibrium</i>
10:20	–	10:40	Coffee break
10:40	–	13:00	<b>2 Session: Quantum liquids, Casimir force</b>
<i>Location: Virtual Zoom Session</i>			
10:40	–	11:00	Bryan J Dalton: <i>Discrete Time Crystals in Ultracold Quantum Gases</i>
11:00	–	11:20	Neill Lambert: <i>Pseudo-modes for bosons and fermions</i>
11:20	–	11:40	Kensuke Kobayashi: <i>Three-body correlations in nonlinear response of correlated quantum liquid</i>
11:40	–	12:00	Gergely Zaránd: <i>Quantum work statistics in chaotic and disordered Fermi liquids</i>
12:00	–	12:20	Yigal Meir: <i>Measuring entropies of exotic quasi-particles?</i>
12:20	–	12:40	Kimball A. Milton: <i>Negative Casimir Entropies and their Implications</i>
12:40	–	13:00	Mauro Antezza: <i>Casimir torque and force on gratings</i>
13:00	–	14:00	Lunch
14:00	–	15:30	<b>3 Session: Biophysics</b>
<i>Location: Virtual Zoom Session</i>			
14:00	–	14:30	Felix Ritort: <i>Information-to-measurement conversion in DNA pulling experiments with feedback: from protocols to strategies</i>

14:30	–	14:50	Saar Rahav:	<i>Uncertainty relation for enzymes, resetting systems, and other processes with irreversible transitions</i>
14:50	–	15:10	Alexandre Zagoskin:	<i>Quantum entanglement of living organisms</i>
15:10	–	15:30	Philip Hemmer:	<i>Biosensing applications of quantum emitters in diamond and phosphors</i>
15:30	–	15:50	Coffee break	
15:50	–	17:00	<b>4 Session: General physics</b>	
			<i>Location: Virtual Zoom Session</i>	
15:50	–	16:20	Georgi Gary Rozenman:	<i>Gravitational and Quantum Mechanical Phenomena in Surface Gravity Water Waves</i>
16:20	–	16:40	Roland E Allen:	<i>Predictions of a fundamental statistical picture, including experimental signatures of a new dark matter WIMP</i>
16:40	–	17:00	Theo M. Nieuwenhuizen:	<i>The interior of astrophysical black holes</i>
17:00	–	17:20	Coffee break	
17:20	–	19:00	<b>5 Session: Quantum Optics</b>	
			<i>Location: Virtual Zoom Session</i>	
17:20	–	17:50	Hui Cao:	<i>Controlling nonlinear dynamics of complex lasers</i>
17:50	–	18:20	A. Douglas Stone:	<i>Reflectionless Excitation of Arbitrary Photonic Structures: A General Theory</i>
18:20	–	18:40	Norbert Kroo:	<i>Plasmon assisted Cooper pair formation at room temperature</i>
18:40	–	19:00	Radim Filip:	<i>Highly non-Gaussian quantum physics</i>
19:00	–	19:30	Free time	
19:30	–	21:00	<b>Concert of classical music</b>	
			<i>Location: Prague Castle - St. Vitus Cathedral and live on internet</i>	

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## Friday, 23 July 2021

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08:30	–	10:20	<b>1 Session: Many body physics, Spins</b>
<i>Location: Virtual Zoom Session</i>			
08:30	–	09:00	Amnon Aharony: <i>Breaking Time-Reversal Symmetry and Spin Selection in chiral molecules</i>
09:00	–	09:30	Ora Entin-Wohlman: <i>Magnetization generated by microwave-induced Rashba interaction</i>
09:30	–	10:00	E.K.U. Gross: <i>Non-adiabatic Berry connection, the mediator of energy, momentum, and angular-momentum transfer between electrons and nuclei</i>
10:00	–	10:20	Yasuhiro Utsumi: <i>Spin selectivity through time-reversal symmetric helical junctions</i>
10:20	–	10:40	Coffee break
10:40	–	13:00	<b>2 Session: Quantum thermodynamics</b>
<i>Location: Virtual Zoom Session</i>			
10:40	–	11:00	Alexia Auffèves: <i>Two-qubit engine fueled by entanglement and local measurements</i>
11:00	–	11:20	Eric Lutz: <i>Experimental verification of a reversed Clausius inequality in a closed system</i>
11:20	–	11:40	Marti Perarnau-Llobet: <i>Optimal cycles for finite-time Carnot engines</i>
11:40	–	12:00	Rafael Sánchez: <i>Interference-induced extrinsic thermoelectrics</i>
12:00	–	12:20	Artur Widera: <i>Quantum probes and quantum engines realized via individual impurities immersed in an ultracold bath.</i>
12:20	–	12:40	Giuseppe Falci: <i>Quantum operations in ultrastrongly coupled quantum networks</i>
12:40	–	13:00	Elisabetta Paladino: <i>Thermal rectification through a nonlinear quantum resonator</i>
13:00	–	14:00	Lunch
14:00	–	15:30	<b>3 Session: Quantum optics</b>
<i>Location: Virtual Zoom Session</i>			

14:00	–	14:30	Olga Kocharovskaya:	<i>Quantum optics with ultra-narrow nuclear resonances</i>
14:30	–	14:50	Frank A Narducci:	<i>On the way to a demonstration of a T-cubed atom interferometer</i>
14:50	–	15:10	Yuri Rostovtsev:	<i>Quantum control and coherence in 2D materials</i>
15:10	–	15:30	Anil Patnaik:	<i>Dispersion of a Single Atom Experienced by Single Photon</i>
15:30	–	15:50	Coffee break	
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15:50	–	17:00	<b>4 session: Nonequilibrium statistical physics</b>	
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<i>Location: Virtual Zoom Session</i>				
15:50	–	16:20	Andrew Armour:	<i>Complex Resonances in Josephson Photonics</i>
16:20	–	16:40	Mark Dykman:	<i>Resonant time-symmetry breaking in coupled oscillators</i>
16:40	–	17:00	Lea F Santos:	<i>Speck of chaos</i>
17:00	–	17:20	Coffee break	
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17:20	–	18:20	<b>5 Session: Many body systems</b>	
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<i>Location: Virtual Zoom Session</i>				
17:20	–	17:50	Joseph Maciejko:	<i>Hyperbolic band theory</i>
17:50	–	18:20	Tamar Seideman:	<i>Quantum Rotational Coherences in Complex Media</i>
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18:20	–	18:50	<b>Closing Remarks</b>	
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<i>Location: Virtual Zoom Session</i>				